



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

ARE MIDSHIPMEN PROPERLY EQUIPPED TO ENTER THE

SUBMARINE COMMUNITY?

A NEEDS ASSESSMENT FOR THE SUBMARINE CAPSTONE

COURSE AT THE UNITED STATES NAVAL ACADEMY

by

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June 2008

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**A NEEDS ASSESSMENT FOR THE SUBMARINE CAPSTONE COURSE AT THE
UNITED STATES NAVAL ACADEMY:
ARE MIDSHIPMEN PROPERLY EQUIPPED TO ENTER THE SUBMARINE
COMMUNITY?**

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Submitted in partial fulfillment of the
requirements for the degree of

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from the

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This thesis examines the perceived gap between the education and training given to midshipmen in their final semester at the United States Naval Academy prior to commissioning, and the expectations of the stakeholders upon receiving that commission. More specifically, this study examines to what level an ensign reporting onboard his first submarine is educated and trained, and whether or not this meets the needs of the command and the Navy. In order to determine if a gap exists, in-depth interviews were conducted with submarine junior officers, submarine commanding officers, and professors at the United States Naval Academy. The needs of each of these stakeholders were then correlated with instructional imperatives required to fulfill each need. Based on these correlations, recommendations are offered on the design of the capstone course.

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I. INTRODUCTION

A. BACKGROUND

The United States Naval Academy is an institution that has a long, proud tradition of producing capable Navy and Marine Corps officers. Imbuing midshipmen with the highest ideals of duty, honor and loyalty, the Naval Academy owes a large part of this tradition to the character, leadership and practical skill development programs.

The programs do more than educate midshipmen on the importance of demonstrating these moral characteristics; they train midshipmen to perform the roles of leading men and women of the naval service. To this end, the Naval Academy strives to provide the necessary balance between training and education that will most benefit to the midshipmen and the service community each will enter. This approach consists of ongoing re-evaluations of what courses should be taught as well as the appropriate amount of resource allocation for each discipline.

The most recent review probed extensively into the academic, professional (PRODEV) and officer development (ODEV) programs. "The basic questions this review sought to address were:

- whether the Academy is educating its graduates to meet the requirements of the Naval Service
- whether [the Academy is] doing so in the most effective and efficient way" (Rempt, 2005a).

The academic review provides a complex view of each of the major programs at the Naval Academy. The portion of the review this research addresses is the potential revision of the professional development and officer

development programs. These programs and their acutely detailed relevance are essential officer preparation for midshipmen.

The professional programs begin during Plebe summer and conclude with a junior officer capstone course. They are designed to provide "core academic courses and practical training to teach the professional and leadership skills required of Navy and Marine Corps officers" (United States Naval Academy Admissions Office Publication, 2005). Plebe summer pushes the officer candidates through their existing limitations as leaders. The capstone course provides fine-tuning for midshipmen about to graduate and begin their designated services within the Navy or Marine Corps.

In order to answer the Superintendent's aforementioned questions, PRODEV and ODEV asked this question: What should the final pre-commissioning preparation for officers in their particular communities encompass? The author is interested in the design of an optimal course of instruction that most fully prepares officers about to enter the submarine community. While a course of instruction already exists, this research probes the stakeholders to determine what, if any, changes would provide a better balance between academic preparation and practical training to best benefit the submarine community's future officers.

B. RESEARCH QUESTIONS

This study focuses on the culminating study of the leadership training: The junior officer Capstone course. This course is the final leadership and officer development

experience for midshipmen. This study concentrates on two main tenets. The first is effective instructional design that will determine the most suitable course construction for the actual educating and training of the midshipmen. The second addresses the needs of the naval service, the needs of the Naval Academy and the needs of the graduating midshipmen. In this way, the research can determine whether the submarine force is currently receiving officers with the sufficient knowledge, skills, abilities and attitudes (KSAAs) required of newly commissioned ensigns. This thesis is completed in conjunction with two other thesis research projects that examine the need for capstone education; in the United States Marine Corps; and in the Navy's Surface Warfare community. Each of these three studies can be used by the Naval Academy to aid in officer education as well as in instructional design.

This study answers the question:

What types of changes to NL402: Naval Leadership Capstone (Submarine Warfare), are necessary to most fully train and educate the midshipman in order to provide them the proper knowledge, skills and abilities required of them in the fleet?

The research also examines the following secondary question that arose during the initial investigation:

What amount of emphasis should the Naval Academy place on naval nuclear power education pre-commissioning?

The Naval Academy invests prodigious amounts of time and energy into producing capable officers. The capstone course is designed and administered by sea-returning submarine officers, in conjunction with the Chair of the

Department of Leadership, Ethics and Law. This study explores what the front-line submariners require and desire from newly accessioned ensigns, and compares this information to the current course directives. From there, the most efficient and effective course design can emerge to ensure that the Naval Academy is sending out graduates who are unquestionably equipped to handle the rigors of the junior officer tour with confidence and meeting the expectations of all who observe him.

C. SCOPE

This study includes an in-depth examination of the current curriculum for NL 402: Junior Officer Capstone (Submarine) with an emphasis on how the course can best benefit the future officers and the fleet. It also provides a description of what the stakeholders see as a viable direction for the course. This study does not explore the other junior officer capstone courses. The initial training pipeline of the junior officer selecting submarines is covered only to the extent that it is relevant to current practices at the Naval Academy.

A large portion of the study focuses on instructional design and the processes necessary to design an effective teaching instrument for the Naval Academy. Instructional Design (ID) includes the scientific process of assessing and evaluating needs in order to best train and/or educate personnel. All sectors of society use ID methods to help both train and educate personnel. The literature shows that the military employs a form of ID to develop every kind of training, from teaching complex maintenance, to designing curricula for classes. This research uses

interviews, focus groups and surveys to conduct a needs analysis and evaluation for course design. A needs analysis is critical to the process and collects the majority of data used in this evaluation of NL402. The information gathered offers conclusions and recommendations on how to strengthen the program.

Discussion of the "core curriculum" appears frequently in this research and in the literature review. For the purpose of this research, the core curriculum refers to those academic courses that are exclusive to Officer and Professional development courses. The researcher distinguishes between the Officer and Professional Development core courses and the academic core courses.

The study incorporates the research done by the Distinguished Military Professor research project (Athens, Campbell, Thomas, Rubel, 2005a) which also examines the design of the Leadership Capstone Course. A focus group conducted by a panel of the Distinguished Military Professors (DMP), Permanent Military Professors (PMP) and the Chairman of the Leadership, Ethics and law Department at the Naval Academy developed that research. These findings prove crucial in attaining a thorough understanding of what the current capstone course is, and ultimately, the direction that those particular stakeholders want the course to follow. The aim of the DMP driven capstone course would be to accomplish the following:

- Have integrated and applied concepts and principles of human behavior, moral and ethical thought, leadership and military justice to their future role as a Junior Officer

- Understand and embody the Armed Forces Officer role identities
- Have reflected on and assessed their USNA leadership experiences and leadership development
- Have developed and refined their personal leadership philosophy

(Athens et al., 2005a)

This study builds on the results of the above mentioned research and further investigates the most effective instructional methods and instruments for assessing ongoing relevance of the specific ID for the capstone course.

D. METHODOLOGY

Interviews conducted for this research project include those with submarine officers stationed on the yard, in addition to submarine officers currently assigned to fleet submarines. Time and cost contribute certain limitations as far as the variety of participants and the depth of the interviews in the pilot work for this research survey. Nonetheless, the 28 officer participants covered a wide range of years and experiences within the submarine community. Commanding officers and junior officers make up the "at-sea" group of officers. The "on-shore" officers are post-junior officer tour, or post-Command tour officers.

Finally, a survey was administered to each of the submarine officers described above. The survey was used to reach a wider audience and prioritize the most important core competencies of a junior officer arriving to his first command. The interview and survey and protocols can be found in the Appendices. The research methodology focuses

on determining what both the submarine service and the Naval Academy desire of the midshipman as he transitions through his final leadership experience at the institution.

E. ORGANIZATION OF STUDY

This study is organized into six chapters. The first chapter explains the purpose of the research and outlines the rest of the paper. It clarifies the research question, presents basic background information about the topic and presents the limitations and methodology of the research. Chapter II gives detailed background information about the USNA educational vision and mission. This includes current curriculum structure and the evolution of the capstone course. Chapter III reviews literature pertaining to instructional design, needs analysis and training versus education in the military environment. Chapter IV discusses the methodology of the study, outlines study participants and describes the interview, focus group and survey techniques used. Chapter V presents the data collected from the interviews, surveys and the focus group. Chapter VI presents the final results, summarizes those results and offers recommendations for the structure and content for improving the course.

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II. BACKGROUND

A. CHAPTER OVERVIEW

This chapter provides an overview of the education and training pipeline each midshipman receives at the Naval Academy. A look into the core curriculum design is worthwhile; however, the research addresses only in the core curriculum design history with an emphasis on the leadership and character development courses and does not cover the majors program and the core academic programs. This chapter also describes the training and education newly commissioned ensigns receive until the point they arrive onboard their initial boat. First, in order to understand the education that the Naval Academy wants the midshipmen to receive, the mission and strategic vision of the Naval Academy is presented. The strategic planning process is reviewed to determine how the Naval Academy seeks to prepare the highest quality officers for the fleet.

The academic, as well as the officer and professional development courses, come under recurring evaluation because they are the primary means of providing a liberal arts education to midshipmen, while the professional and officer development programs provide military training and education. In order to ensure that it is meeting its goal, the Naval Academy periodically reviews its education and training programs. This research can augment the review process and therefore provide a more thorough look into the formation and transformation of the Submarine Officer Capstone course. Finally, submariner post-graduate

training provides crucial insight into the appropriate design of the capstone course contents.

B. NAVAL ACADEMY STRATEGIC PLANNING

The strategic plan is the foundation from which all future naval Academy policy decisions will be based. This plan provides a constancy of purpose and detailed strategies to achieve our vision of the future. It will capitalize on our many strengths, stimulate innovation and integrated process improvement in an ever changing environment.

(United States Naval Academy [USNA], 1994)

Admiral Larson and the Executive Steering Committee (ESC) first established the idea of a Naval Academy Strategic Plan with set goals, a purpose and a commitment for the future. They knew the needs of the Naval Academy would change and the plan would be revised and re-issued on an annual basis to make adjustments and corrections in order to realize a vision of the Naval Academy in the 21st century. (USNA, 1994).

Evidence that the original vision of the strategic planning process works was presented in 2007 when review process results reaffirmed the validity of the Naval Academy mission:

To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty, in order to provide graduates who are dedicated to a career of naval service and have the potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government.

(Rempt, 2005c)

The strategy to achieve the vision focuses around academic excellence, effective communications, character building, leadership and professional excellence, physical fitness, naval heritage and academic quality of life. Although all are important in developing the midshipman, three of these principles are especially pertinent to this research and are therefore explored in greater detail: Academic Excellence, Leadership and professional excellence and character building.

1. Academic Excellence

The academic program at the Naval Academy seeks to substantially contribute to the development of the character of the midshipmen (United States Naval Academy Admissions Office Publication, 2005). The goal is to:

- Foster an educational environment that supports and encourages midshipman learning and critical thinking.
- Employ appropriate teaching methods that address the variety of midshipman learning styles.
- Provide an outstanding civilian faculty and the necessary support resources to enable midshipmen to achieve academic success.
- Provide a stimulating environment that instills a passion for lifelong learning.
- Imbue our midshipmen with the intellectual curiosity and analytical rigor needed to be in the forefront of technological advances and international understanding in a rapidly changing world.
- Provide opportunities for our faculty and staff to remain leaders in their respective disciplines and in the latest teaching methods. (Rempt, 2005c)

The core curriculum provides the central part of the educational experience of midshipmen. It is that part of the curriculum that is essentially common to all midshipmen in a graduating class. In total credits or number of courses, it forms about two thirds of a midshipman's academic program. The core courses contribute to the development of midshipmen as well-educated citizens and prepare them with the professional and technical background essential to assuming the duties of junior officers in the Naval Service. (United States Naval Academy Academic Dean website, 2006)

2. Leadership and Professional Excellence

Another focus of the Naval Academy is Leadership and Professional Excellence. The Naval Academy defines this as being able to:

- Prepare midshipmen for the opportunities of command and the challenges and realities of combat leadership.
- Imbue midshipmen with a profound respect for the Constitution and the importance of the chain of command.
- Promote an understanding of and demonstrate a commitment to the highest standards of moral and ethical behavior.
- Foster an environment that promotes mutual trust, loyalty and personal accountability in everything [they] do.
- Provide midshipmen with the professional skills necessary to be successful Navy and Marine Corps officers. (Rempt, 2005c)

The Division of Professional Development is tasked with carrying out this vision. They fulfill the academic, leadership and professional excellence goals by offering core programs in each venue. These core courses help the

midshipmen to develop their own personal leadership style by providing the necessary principles of law, psychology, leadership, ethics and philosophy. (United States Naval Academy Admissions Office Publication, 2005) The Leadership Continuum concept as shown in Table 1 emphasizes the classroom education and training necessary to establish the baseline knowledge, skills, attitude and abilities (KSAAs) for the junior officer. Until the first-class year, the continua are generic in regard to the specific warfare community the graduate chooses. The final capstone course is the only academic avenue available to teach the future junior officers community-specific fundamentals.

The Leadership Continuum							
4/C YEAR		3/C YEAR		2/C YEAR		1/C YEAR	
Plebe Summer	Plebe Year	Fleet/Cruise / Open Ocean Sail	3/C Year	PROTRAMID / Yard Patrol	2/C Year	Fleet Cruise / Small Unit Leadership	1/C Year
Leadership & Human Behavior		Ethics		Leadership Theory & Application		Law & Capstone Course	
<u>Know Yourself</u> Followership Personality Motivation Human behavior		<u>Moral Reasoning</u> Professional Ethics Use of Force Character & Duty		<u>Know Your People</u> Fleet case studies Transformational Leadership Group Behavior		<u>Know Your Job</u> UCMJ Fleet & Operational Focus Warfare/Community Preparation	

Table 1. USNA Leadership Continuum

There are also core courses that provide Naval Academy graduates with the necessary practical, hands-on training that is reinforced through various programs discussed in the next section. These core courses are most closely aligned with the Maritime Continuum, presented in Table 2, and they focus on the skills that will make the Naval Academy graduate a more capable mariner.

The Maritime Continuum							
4/C YEAR		3/C YEAR		2/C YEAR		1/C YEAR	
Plebe Summer	Plebe Year	3/C Cruise	3/C Year	2/C Cruise	2/C Year	1/C Cruise	1/C Year
P100 Sailing / Damage Control	NS100 Naval Science	CSNTS / Fleet Cruise	NN204 Navigation & Piloting	LANTPAT YP Cruise	NS310 Strategy & Tactics	Fleet Cruise	NS40X JO Practicum
<u>The Basics</u> Deck Seamanship Charts / Intro to Piloting Rules of the Road Maneuvering Boards		<u>Advanced Knowledge</u> Celestial/ Electronic Nav Tides Currents Weather Piloting Mastery At-Sea Application		<u>Putting it together</u> Naval Strategy Fleet Communications Warfare Tactics LANTPAT execution		<u>Ready for the Fleet</u> Fleet Training Warfare-specific practicum	

Table 2. USNA Maritime Continuum

3. Character Building

The goal of the Naval Academy is to provide the naval service with leaders of character who will serve the nation in peace and war. (United States Naval Academy Admissions Office Publication, 2005) The strategic vision defines character building as providing the midshipman the ability to:

- Do the "right thing" and promote selfless service.
- Ensure moral development and character building permeates the Naval Academy experience.
- Inculcate the core values of honor, courage and commitment.
- Promote a lifetime commitment to the highest standards of moral and ethical behavior. (Rempt, 2005c)

There is classroom-based education for these four main tenets of the Naval Academy's strategic vision. They are supplemented by a variety of initiatives that allow the midshipmen to experience a more hands-on approach to leadership development. Chapter III explains the core professional and leadership development courses in greater detail.

4. Curriculum Review

During the 2005 academic year, the Superintendent of the Naval Academy conducted a systematic review of the majors and core curriculum offered to the midshipman. The Naval Academy core curriculum is intended to provide a sufficient foundation for every midshipman to enter any service assignment with a basic degree of competence in foundational science and engineering fields, symbolic

reasoning, English language fluency, moral and ethical awareness and knowledge of Western institutions and values. (Rempt, 2005a)

Review of the core curriculum revealed several areas in which it "has gaps or rigidities that are increasingly at odds" with the mission of the Naval Academy and in the military's global strategic missions exist. (Rempt, 2005a) A study conducted by Distinguished Military Professors (DMP) at the Naval Academy found similar problems with the officer and professional development core courses. (Athens, et al. 2005a)

a. *The History: Curriculum 21*

Chartered in 1997 by Superintendent Admiral Larson Curriculum 21 (C21) was tasked to review demands on midshipmen and to optimize the balance between:

- Academic vs. professional development.
- Mathematics, science and engineering vs. humanities and social sciences curricula.

C21 included participants from a senior core/support group of faculty and staff at the Naval Academy, as well as senior leadership from the naval service outside of the Naval Academy. These participants reviewed all aspects of curriculum and midshipman professional life both inside the classroom and outside of it. It included a detailed analysis of midshipman life in Bancroft Hall and experiences and activities on the yard and during the summer. (Athens et al., 2005a)

This study found that the curriculum is fundamentally sound and that a good balance exists between professional development and academic education. They

concluded, as did the strategic review, that the mission would remain unchanged, and that with a common core, any major would permit entry to any warfare specialty. (Athens et al, 2005a)

b. The Present and Future

The Naval Academy has a formal process for changing anything in the core curriculum. *Academic Dean and Provost Instruction 5420.20D* presents a thorough review procedure for what is labeled "non-routine changes." Examples of non-routine changes include, but are not limited to the following:

- Any change to a core course.
- Any change in number of credit hours or contact hours of a course.
- Additions, deletions, or other significant change to a major matrix. (ACDEANINST 5420.20D)

The curriculum review is relevant to this research and presented in Figure 1 for an examination into the internal stakeholders involved in the formal process.

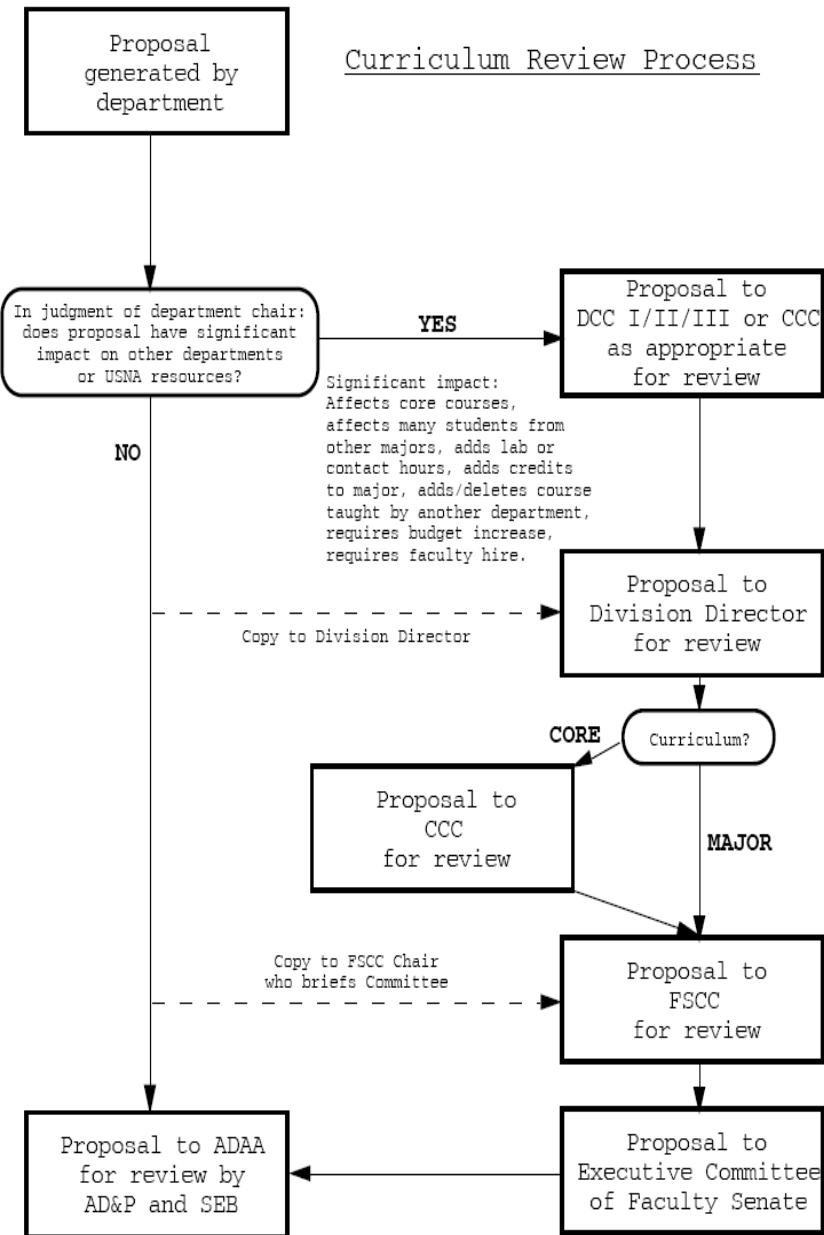


Figure 1. Curricula Review Process per *AcDeanINST 5420.20D*

C. SUMMER TRAINING

As seen in each of the continua shown in Tables 1 and 2, respectively, after the spring semester at the Naval Academy, all of the students participate in follow-on

summer training to reinforce and enhance the lessons learned during the academic year. Summer training furthers the professional development of midshipman by familiarizing them with operational naval forces, giving them the chance to observe enlisted personnel and officers performing their duties and acquainting them with skills they will require as junior officers. The training events of the summer are specifically sequenced into the Naval Academy four-year education and training plan and complement the lessons learned in the classroom. (COMDTMIDNOTE 1530, 2006)

Plebe summer is the immersion into the military for the majority of the incoming freshman class. Plebes are introduced to basic military indoctrination, physical education, basic seamanship and sailing, small arms training, first aid and the honor and character development programs. Plebe Summer introduces military accountability to the incoming class. Midshipmen entering their senior year are given the responsibility of indoctrinating, training and educating the entering class of freshmen. For many of them, this is the first chance to develop their personal leadership style in an environment similar to that which they will see upon graduation and commissioning.

Each subsequent undergraduate summer explores a variety of opportunities aimed at expanding understanding of naval forces and of their role in this ever-changing environment. Summer training is not limited to operating with naval forces. Midshipmen are also afforded the opportunity to participate in internships, additional academic classes or community-building projects in impoverished countries.

D. CAPSTONE COURSE

The capstone course is the final academic course a midshipman takes before earning his commission. Due to the breadth of nuclear propulsion training, the submarine community has struggled to find the appropriate balance of instructional time to meet all stakeholder needs. The description of the course offers an initial look into what it aims to do:

A course to provide information on the duties and responsibilities required of a junior officer in the submarine community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the submarine force. Lab includes submarine operations practical exercise through the use of submarine simulation software.

(United States Naval Academy Admissions Office Publication, 2005)

This description is the result of changes to the curriculum over the years. Although this is the most recent description, this research will show that this is not consistent with what the course actually provides the midshipmen.

1. Practicum, NS40X (1995-2004)

Prior to 1995 the first-class Leadership Capstone, or practicum as it was referred to prior to 2005, was not a graduation requirement. Although similar courses were offered as early as the 1960s, they were offered to midshipmen as elective courses. The graduating class of 1995 was the first group required to take the course. The mandatory course was initially implemented as a response to

the need to provide midshipmen the tools required to be successful in their first professional school. (Cox, 2007)

According to Gannon (2000) as cited by Cox (2007), the primary objectives of the course were:

To provide midshipmen with a professional background that will prepare them for the service community they are about to enter, whether that be SWOS, nuclear power school, flight training or TBS (Gannon, 2000).

The secondary objectives of the course were:

1. To provide midshipmen with a broader understanding of the Navy and Marine Corps, their components and how they work together. This understanding will increase their ability to articulate what the Navy and Marine Corps are about and will also increase their understanding of the challenges and opportunities that will become apparent to them as newly commissioned officers.
2. To provide midshipmen with a specific depth of understanding expected of a graduate of a service academy regarding joint operations, information technology and military sociology. (Gannon, 2000)

To accomplish these objectives, active duty Naval Academy faculty and staff pooled their professional knowledge to generate course material; however, instructors taught primarily from their Fleet experience. No institution-directed, collective changes were made to the NS40X curriculum until 2005. (Gannon, 2000)

2. Capstone (2005-Present)

As a result of the 2005 Academic Program Review, the academic organization of the Naval Academy was restructured. Professional Development Division was split into PRODEV and ODEV. As a result of the restructuring,

responsibility for the course falls under Officer Development Division. The intent is that it be transitioned from a primarily training course to one with a balance of leadership education and practical training: a true leadership capstone. The stated purpose and vision of the course is:

The purpose of the Naval Leadership CAPSTONE course (NL 401-406) is to serve as the culminating leadership experience for 1/C MIDN in the area of leadership, character and warfare community-specific development. NL 40X augments the classroom environment with intensive laboratories designed to provide knowledge, skills and abilities that will serve MIDN as they transition to service as commissioned officers (Thomas, 2005).

The DMP study looked into several options regarding changes to the leadership and professional development courses. Central to this study was the attempt to move towards dividing the traditional capstone course between two divisions, ODEV and PRODEV, each with separate purposes. The ODEV course aims to "culminate the USNA leadership experience," while the PRODEV course strives to "prepare midshipmen for the fleet" (Athens, et al., 2005). Greater detail about these course modifications appears in the next chapter.

The leadership capstone course remains essentially unchanged because the course coordinators are sea-returning junior officers with no training in instructional design. They build the curricula based on a very limited number of stakeholders and establish their syllabus based on the one used for the previous year (Jordan, 2006). The instructors are submarine officers selected from the small pool of officers available on the Naval Academy grounds. This

research investigates these and other problems, with the intention of providing requirements for the course based on its findings.

This course is the final preparation the midshipmen receive as they transfer into their fleet training pipelines. For submarine officers, the 15-month pipeline concentrates heavily on technical expertise and not at all on professional, officer or leadership development.

E. SUBMARINE TRAINING PIPELINE

1. Nuclear Power School

During the service selection and assignment process, the only real selection the future junior officer makes is the day on which he will begin nuclear power training. He will neither choose on which platform he will serve, nor its location. These choices take place at a later date, taking into account attrition and force shaping. This evenly spreads the graduating class of perspective submarine officers over the period of several months, which makes it easier to meet future manning requirements.

Naval Nuclear Propulsion Training Command (NNPTC) exists to educate all reactor plant operators, officer and enlisted, on the essentials of nuclear power and nuclear propulsion. Newly graduated ensigns will spend six months completing an intense training regimen consisting of (course and classroom hours): mathematics (39), physics (71), chemistry (50), thermodynamics (87), electrical engineering (138), material science (28), reactor dynamics and core characteristics (86), reactor plant systems (13), shielding and radiological fundamentals (46) and aspects of reactor plant operations (115).

Students are required to pass examinations in each of the topic areas as well as a comprehensive examination at the end of the training period. Failing to pass the examinations in more than two of the subject areas, or failing the comprehensive examination warrants an academic review board where the students will either be dismissed from the nuclear propulsion training pipeline or placed on an academic hold and required to remediate their weak area(s). When the junior officer completes this theory-based instruction, it is time to put his training to the test on a live nuclear reactor.

2. Nuclear Power Training Units

Nuclear power training Units (NPTU) are prototype nuclear reactors. The prototypes serve a two-fold purpose: To test power plant designs and to train Navy personnel to operate and maintain nuclear propulsion plants. The prototypes are identical in nearly all aspects to their sea-going counterparts. The typical trainee spends six months qualifying as a nuclear power plant operator. Part of this period is spent learning, in detail, all of the systems and components of the prototype. In order to provide the highest degree of competence and safety in nuclear propulsion plant operations, it is essential that all operators have a thorough understanding of the plant as a whole. By the time a trainee reports to the nuclear-powered vessel, she or he already has considerable experience in operating and maintaining a nuclear propulsion plant. They also leave with an idea on what it takes to qualify on the submarine or aircraft carrier (NPTUs are responsible for training both submarine and surface nuclear operators). From there, the submarine

officers leave the nuclear training portion of the pipeline and transition to the last classroom training they will receive prior to reporting onboard the submarine.

3. Submarine Officer Basic Course

This is the final course of formalized instruction the ensign receives prior to reporting to his first command. Located in New London, Connecticut, this course covers a variety of topics that have not been discussed to date, but will be very important that he comprehend once he steps onboard. The Submarine Officer Basic Course is twelve weeks long and teaches theory, construction and operation of nuclear powered submarines. In preparation for their first assignment, students receive instruction in shipboard organization, damage control and submarine safety and escape procedures. Students also receive instruction in the areas of submarine weapons, fire control and sonar systems in order to be a fully contributing member of a ship's wardroom from the day they report onboard. Courses are taught by sea-returning junior officers similar to those at the Naval Academy who are in charge of the capstone course. Leadership training is limited to what "sea-stories" the instructors share with the ensigns. Very little instruction is given on expected levels of leadership performance. This observable fact will be covered in greater detail in following chapters.

F. CHAPTER REVIEW

This chapter presents courses that prepare the Naval Academy midshipman to be a competent submarine junior officer. There are, of course, many other inputs into this process, but these courses are what the Naval Academy has

in place as the formalized course of instruction. There is a mix of training, education, classroom work and practical exercises. Having a background of what the formal instruction consists of helps to point out where a KSAA gap may exist.

This chapter also examines the strategic planning process the Naval Academy undertakes to ensure the leadership development process remains balanced and relevant. The recent history of curricula review justifies this research as crucial to ensuring midshipmen receive the best and most appropriate training and education possible. The importance of performing a thorough analysis of the curricula is discussed in Chapter IV.

Finally, this chapter covers the nuclear training pipeline for the newly commissioned ensign. The training pipeline after graduation is set up to provide a capable nuclear watch-stander. There is very little leadership training after leaving the Naval Academy. This makes it that much more important that the graduates go off with as strong a base as possible, because they will have almost no chance to practice these skills before they step foot in front of their first division. The following chapter will explore literature that relates to instructional design, education and training and conducting an effective and relevant needs analysis and evaluation.

III. LITERATURE REVIEW

A. CHAPTER OVERVIEW

This chapter examines literature that aids in determining the type of course that most benefits the midshipmen, the Naval Academy and the submarine community.

First, literature dealing with instructional design (or development) (ID) for higher education offers an idea of what processes must take place in order to provide a functional, relevant course. The entire process of instructional design is complex and outside the scope of this thesis; however, the theories and strategies for implementing those processes provide good insight into understanding the needs of the course. This researcher examines some commonly accepted theories on instructional design and adapts them to the needs of the research.

Course needs identification is essential to the accuracy and validity of this research. Therefore, the literature review centers on how to best determine those needs. This chapter examines the validity of conducting a needs analysis and end-to-end assessment of NL402. A useful model for interpreting needs is introduced. This model, along with the needs, allows for interpretation of surveys and analysis of results.

Finally, applying the finished product (an assessment tool prepared for on-going use) to the Navy's needs is the end-state; therefore, this chapter explores literature that addresses the concerns of training versus education and the idea of what a truly relevant and effective capstone course

should look like and accomplish. This chapter explores the advantages and disadvantages of different capstone course theories and design.

B. INSTRUCTIONAL DEVELOPMENT

1. An Introduction

Instructional development (ID) is a systematic and systemic process used to design and develop education and training programs (Pershing and Lee, 2004). The basic elements of instructional development involve the following steps: Plan, Analyze, Develop, Design, Implement and Evaluate (PADDIE). These categories are further separated into how they are handled in real-world applications. Analysis and evaluation are approached alone while design, development and implementation are grouped and dealt with as a single process.

The field of ID has undergone significant change since its inception in the 1960s. Originally a primarily linear process, ID now embraces new methods that allow greater flexibility in the management and order of design activities (Wilson, Jonassen, Cole, 1993). A cognitive view of instruction argues that both training and educational systems need a better repertoire of effective strategies to make material more meaningful and useful to learners (Wilson et al., 1993).

The ID process is important in this research because it gives the focus for where modification and improvement should occur. ID focuses on evaluating the needs of all: the learner, the teacher and the organization as a whole.

2. Instructional Design at the Naval Academy

Boettcher & Conrad (1999) describe instructional design in this context as "the process of designing the environment, methods and resources for effective learning of specified goals and objectives." In order to fulfill the goals and objectives of the Naval Academy, the program must fulfill the needs of the midshipman and the needs of the submarine community; or, more generically, the fleet and Marine Corps entities that receive the newly commissioned officers. In order to fulfill this need, this research focuses on instructional design as this process provides an effective means of establishing the relationships between stakeholders and course design and is used for the remainder of this research.

There is great immediate demand on the Naval Academy graduate in the submarine force as he steps into the role of a junior officer. He must perform at a high level of both intensity and excellence. Throughout the course of this research, a recurring theme of on-the-job training, and its importance, comes to light. Wilson et al. (1993) cites the Collins-Brown (1991) model of cognitive apprenticeship, which contains several instructional imperatives that apply directly to this need and can be applied toward the overall success of the Naval Academy's professional and leadership development goals. The model uses the following imperatives:

- Training and Education: Teach tacit, heuristic knowledge as well as textbook knowledge.
- Situational: Teach knowledge and skills in contexts that reflect the way the knowledge will be useful in real life.

- Modeling and explaining: Show how a process unfolds and tell reasons why it happens that way.
- Coaching and Feedback: Observe students as they try to complete tasks and provide hints and help when needed.

Wilson, et al., 1993)

This model is set up to optimize learning in a variety training environment. Although very useful, the Naval Academy does not have the resources to develop this type of apprenticeship program. However, the concepts and principles can be used to describe the instructional imperatives that are necessary for proper course design.

C. NEEDS EVALUATION

For the purpose of this research, a need can be defined as the gap between desired and current status. As stated before, a gap has been identified by stakeholders concerning the content and direction of the NL40X capstone series of courses. Information needs to be collected in order to determine the best way to bridge the gap. Armstrong (2004) cites Hanlis (2001) that, in the context of ID, in order to collect this information a formal needs assessment is usually conducted (Armstrong, 2004). The needs assessment falls under the "Analyze" portion of the PADDIE Model and is crucial to the rest of the ID process. Several factors are necessary to produce a valid needs assessment. Essentially, this is a brainstorming exercise with all of the identifiable stakeholders.

Rossett states that the reasons to conduct a needs analysis are the introduction or rollout of a new product, responding to an existing performance problem and recognizing a need to develop personnel so they can

continue to contribute to the growth of the company. The analysis can act as a development tool for strategic planning (Morrison, et al., 2004). No formal assessment has ever been conducted for the Capstone course and Morrison, Ross and Kemp citing Rossett (1999) point out that this program meets all four opportunities for a needs analysis (Morrison, Ross, Kemp, 2004). For example:

- With the DMP project, the course will be brand new in content and structure.
- There is a recognized gap between the current and desired course.
- The Naval Academy's strategic plan includes academic excellence which prepares midshipmen to excel in an ever changing technical environment.
- This needs analysis could be copied in the future to include other curricular changes, consistent with the Naval Academy's strategic vision.

1. The Assessment

Morrison et al.(2004), state that the needs assessment process serves four functions:

- It identifies the needs relevant to a particular job or task, that is, what problems are affecting performance.
- It identifies critical needs. Critical needs include those that have a significant financial impact, affect safety or disrupt the work or educational environment.
- It sets priorities for selecting an intervention.
- It provides baseline data to assess the effectiveness of the instruction.

Since the course is already established, it is not relevant to gather baseline data. This research is meant to gather relevant stakeholder inputs and incorporate them

into a plan for future course design that can go before the academic review process as a targeted intervention.

This needs analysis assessment, along with the ID process, provides the necessary tools required to evaluate the effectiveness of the NL402 course. In order to understand how the course will be most effective, the next section examines the debate of what a capstone course should look like and accomplish versus what the Naval Academy wants the course to look like and accomplish.

D. TRAINING VERSUS EDUCATION

The entering argument into how the NL402 course should be structured is based on the goal of the Curriculum 21 project: How does the Naval Academy balance academic vs. professional development? Broken down to its more elemental properties, the question becomes one of balancing training and education. Training, as defined by the 29th Commandant of the Marine Corps, General Al Gray, is:

The conduct of instruction, discipline, or drill; the building in of information and procedures; and the progressive repetition of tasks, the product of which is skill development and proficiency (Gray, 1991)

This speaks to training being structured around memorization through repetition. The goals of PRODEV are to prepare midshipmen to be professional officers in the naval service and develop skills in the classroom environment.

1. Professional Development

The Department of Professional Programs provides the opportunity for midshipmen to move out of the classroom and

experience life at sea with operational fleets. The staff and faculty are comprised of both military and civilian instructors providing a diversified learning environment for the midshipmen.

a. NS 101: Seamanship

This course provides the basic maritime background in general ship characteristics, ship handling and International and Inland Navigational Rules (i.e., Rules of the Road). It includes at-sea labs on 108-foot Yard Patrol (YP) Craft where midshipmen gain hands-on ship maneuvering experience and practical application of the Navigation Rules.

b. NN 204: Navigation and Piloting

Midshipmen third-class all receive further instruction on the basic piloting concepts learned in NS 101. The course is designed to increase the student's general understanding of navigation as it applies at sea, on land and in the air. The advanced navigational topics also provide midshipmen with the tools to conduct voyage planning and to stand watch bridge watches on any naval ship. Advanced topics include celestial, electronic and digital, air and land navigation. Midshipmen will be ready for their LANTPAT second-class summer cruise following successful completion of this course.

c. NS 300: Strategy and Tactics

This course provides instruction on the basic elements of strategic thought in military operations by Sun Tzu, Jomini, Mahan and Corbett. Case studies are examined as well as current U.S. National, Joint and Maritime

strategy/doctrine and their applications. The application of basic warfare tactics is accomplished via use of Fleet Command, a commercial tactical gaming program.

d. NS 402: JO Practicum

This course provides information on the duties and responsibilities required of a junior officer in the submarine community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the submarine force. Labs include submarine operations practical exercises through the use of submarine simulation software. (<http://www.usna.edu/ProDev/>)

Education, on the other hand, is described by Gray as:

The process of moral and mental development; the drawing out of students to initiate the learning process and bring their own interpretations and energies to bear, the product of which is a creative mind (Gray, 1991).

Gray's definition implies that education is built around organizing knowledge, mastering the details and engaging in active analysis. This definition is closely aligned with the goals of ODEV, which is to integrate the moral, ethical and character development of midshipmen across every aspect of the Naval Academy experience.

2. Officer Development

The goal of the officer development division is to integrate the moral, ethical and character development of midshipmen across every aspect of the Naval Academy experience. The integrated officer development program is the single most important feature that distinguishes the

Naval Academy from other educational institutions and officer commissioning sources. A description of the core courses in the Division of Officer Development is provided below.

a. *NL 112: Leadership and Human Behavior*

Midshipmen examine fundamental tenets of leadership in the context of the theories and principles of individual and group behavior during their first semester. Topics include self-leadership, self-management and team-leadership, as well as seminars with first-class midshipmen. The course instructor provides relevant personal and Fleet-based examples and emphasizes interactive learning.

b. *NE 203: Ethics and Moral Reasoning for the Naval Leader*

This course is structured around classical and contemporary writing in moral philosophy. Current and historical case studies are used to show how these fundamental ideas can be applied to the service of the professional military leader.

c. *NL 310: Leadership: Theory and Application*

Third-year students continue to build on concepts introduced in NL110, examining the leadership process by focusing on the dynamic interaction of "the leader, the followers and the situation." The course uses readings by experts in the fields of military sociology, social psychology, organizational behavior and group dynamics in an application-oriented and case-study-driven approach to

bridging the experience gap between the students' roles as midshipmen and the challenges they will face as first-tour naval leaders.

d. *NL 400: Law for the Junior Officer*

This course provides a broad survey of military law applicable to the junior officer. Students examine operational law concepts including the Law of Armed Conflict and the Law of the Sea. This course also explores a variety of military justice topics including constitutional issues such as search and seizure and self-incrimination, judicial and non-judicial forums and the administrative separation of enlisted service members from the Navy and Marine Corps.

E. WHAT KIND OF CAPSTONE DOES THE NAVAL ACADEMY WANT?

As noted in earlier chapters, the Naval Academy is at a cross-road with regard to the Practicum/Capstone course. The course has undergone significant changes since its formal inception in 1995; however, none of these changes took place utilizing a formal instructional design review process, or even a needs assessment, to gauge stakeholder interest in the curriculum design. Along with the tools already mentioned in this chapter, this researcher explores literature pertaining to different theories of capstone course design. Using all of these methods both validates the research and leads to useful, comprehensive information on a suitable design for this course.

1. Practicum versus Capstone Course

A practicum is a school or college course, especially one in a specialized field of study that is designed to

give students supervised practical application of previously studied theory. According to Wagenaar (1993), as cited in Sargent, Pennington and Sitton (2003), a capstone course is defined as "a culminating experience in which students are expected to integrate, extend, critique and apply knowledge gained in the major." According to the course description of NL402, it falls into neither of these definitions. This leads to question under which category the course should fall. A closer look at what the true nature of a capstone course is, and what the Naval Academy wants out of its graduates, may provide insight into this question.

2. Need for a True Capstone Course

Sargent et al. points out that:

The capstone experience offers students the opportunity to enhance the knowledge and skills they have acquired in previous classes. One of the strongest assets of the capstone course is the collaboration of students throughout the semester. They learn quickly that teamwork and cooperation are vital to the success of the entire project, just as those skills are necessary in the workplace. They also learn to draw from each other's strengths and help each other through weaker areas (Sargent et al., 2003).

This falls in line with the direction the Academy establishes in the Leadership Continuum. These points illustrate more of an educational-based course; knowing the job as an officer, as opposed to knowing the job as a submariner. The implications of training versus education were already described but this supports the internal struggle between ODEV and PRODEV for rights to the capstone course.

3. Dome or Spire?

The paper, The Senior Capstone: Dome or Spire? (Heinemann, 1997), perfectly illustrates this struggle for design of the program. According to Heinemann, "there are undoubtedly more variations of content for the senior capstone course than for any other common course taught by colleges and universities" (Heinemann, 1997). The two variations used in his paper are the intellectual consolidation (symbolized by a dome) and intellectual expansion (symbolized by a spire). Heinemann's paper helps guide this research by asking some important questions that are used for the remainder of study:

- What should be the emphasis of a capstone course, closure or further exploration?
- Can they both reasonably be accomplished in the time allotted?
- Since the goals seem to move in opposite directions, is one cancelled out by including the other?
- If we are forced to chose between the two, which should be emphasized?

(Heinemann, 1997)

During the DMP focus group, this study was a central theme and discussed in detail was Heinemann's excellent arguments for and against each technique, which will be briefly covered in the next two sections. This data was collected in concert with Cox (2007).

a. For and Against the Dome

The case for the dome is obvious and easily made. According to Heinemann, the first benefit of a capstone that provides closure is "practical necessity." Students in any discipline, including leadership, undergo varying

instruction and experiences and synthesize material in different ways. A senior capstone is arguably the most effective way to level the playing field. The second benefit of a dome is "market necessity." "Students themselves desire and need a sense of what we have learned" (Heinemann, 1997). The third benefit is "semantic necessity." Heinemann states that "only integrated knowledge is meaningful," and cites a 1991 study performed by the Association of American Colleges, that concluded that "the end of the major ought to be a time for integrating knowledge, concepts and capacities from different parts of student's learning experiences" (Heinemann, 1997). The last benefit is "pragmatic necessity," which is founded on the belief that "only integrated knowledge is useful" (Heinemann, 1997). By the end of their major, or leadership pipeline, students should be able to apply the knowledge and concepts that they learned to situations that are unfamiliar to them (Cox, 2007).

Heinemann identifies three possible problems to a capstone that provides closure. The first arises when the course focuses on reviewing previous material at the expense of integrating the material. He states, "When this occurs we are left with a cheap rehash of content from other courses without an overall synthesis" (Heinemann, 1997). The second problem is the opposite of the first. This occurs when the emphasis is placed in synthesis at the expense of reviewing prior course material. In this case, the "vision becomes so enlarged that it completely betrays the discipline" (Heinemann, 1997). The third problem is the case-study syndrome, in which teachers and students

become so focused on the minutiae of a problem that they find themselves exploring material that is beyond their area of expertise (Cox, 2007).

b. For and Against the Spire

The case for the spire is not as obvious and easily made as that for the dome. Heinemann states that the first advantage of a capstone that is designed to promote further exploration is "preparation for the real world of work." In this capacity, a capstone course could ensure realistic expectations for what their first job will be like. The second benefit is preparing students for a rapidly changing workplace. Although Heinemann makes this claim in the context of communication studies, it can easily be substantiated in other contexts, including modern Navy operations. USNA students must be prepared to enter their profession as agents of the state, who operate in rapidly changing geo-political environments. Furthermore, they must be prepared to be faced with unprecedented technological challenges and innovations, and organizational, procedural and ideological change. Heinemann sums this point up by stating "how can we ignore these issues that make our texts and courses obsolete, sometimes before graduation" (Heinemann, 1997). The third and last benefit of a spire is "preparation for citizenship." Although the Naval Academy spends four years preparing its students for citizenship, the capstone remains a viable venue for ensuring students meet the moral and ethical standards expected of a USNA graduate serving in the Navy or Marine Corps.

Heinemann observes three problems involved with designing and implementing a spire. The first occurs when

instructors attempt to cover too much new material, or too many different things. He notes that often, professors attempt to cover "everything important that was left out of the major or the core of the major" (Heinemann, 1997). He states that this philosophy is unworkable because there within any course of study more is left out than is included. The second problem is that if the capstone overemphasizes practical material, the course becomes "petty and superficial" (Heinemann, 1997). He believes that even personally important subject matter should be left out of the course. The third problem with the spire occurs when the boundaries of the discipline are breached: "Getting off the subject is easier in the senior capstone course than any other course" (Cox, 2007).

F. CHAPTER REVIEW

This chapter reviewed published literature that provides the framework for conducting an in-depth focused assessment of NL402. The capstone course literature explains that the capstone is possible here at the Naval Academy, as the frame-work is already in place to accomplish both intellectual consolidation (Dome) and/or intellectual expansion (Spire). The needs analysis, in an instructional design format, gathers useful information in identifying stakeholder interests. The needs assessment techniques utilized in the next chapters allow for the right mix of one-on-one interviews and survey data. Qualitative research methods are certainly the most adaptable methods for this type of open-ended research and the next chapter will elaborate on the use of these techniques.

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IV. RESEARCH METHODOLOGY

A. CHAPTER OVERVIEW

This chapter provides a discussion of the methodology used in the collection and analysis of data cited in this thesis. Included here is the rationale of utilizing qualitative methods, a description of the participants and the data collection methods.

B. QUALITATIVE RESEARCH METHODS

Why are qualitative research techniques right for this research? The researcher had to ask: Would it not be more valid to send out a large-scale survey and base the needs assessment on that data? Creswell (2003) explains qualitative research, citing Morse (1991), as this:

Characteristics of a qualitative research problem are: (a) the concept is "immature" due to a conspicuous lack of theory and previous research; (b) a notion that the available theory may be inaccurate, inappropriate, incorrect or biased; (c) a need exists to explore and describe the phenomena and to develop theory; or (d) the nature of the phenomenon may not be suited to quantitative measures. (Creswell, 2003)

The research for this paper aligns with Morse's characteristics. This is the first time that a needs analysis has been attempted for the Capstone course at the Naval Academy. Creswell also defines the grounded theory strategy as qualitative research by which the researcher attempts to derive a general, abstract theory of a process grounded in the views of participants in a study (Creswell, 2003). The researcher relies on the participants to drive the research based on the Naval Academy's desire to ensure

the design of NL402 is satisfactory to all of the stakeholders (defined in the next section). Although this research has elements that are suited to quantitative research, there is overwhelming evidence that an exploratory look into this topic will bear greater gains. However, once prevalent themes emerge, it would be easy to place them in a survey tool and seek a large quantity of return data for processing. Wiersma, in his work on research methods, states that before research gets underway "decisions are made about the subjects or sites to be studied, the length of time for data collection and possible variables to be considered" (Wiersma, 1991). Popular methods of qualitative research involve interviews, focus groups and surveys. All three methods were used in this research and each is explained later on in this chapter.

C. PARTICIPANTS/STAKEHOLDERS

Stakeholders are defined as "individuals or organizations who stand to gain or lose from the success or failure of a system" (Nuseibeh and Easterbrook, 2000). In this research there are three types of stakeholders involved in the training and education system development.

1. The Junior Officer (JO): The Midshipmen/Ensign

The first stakeholder is the individual who acquires the skills and capabilities to perform his job within the operational system and environment (Jeffery & Bratton-Jeffery, 2004). In this research, the midshipman attempts to gain the requisite knowledge, skills, abilities and attitudes to perform well once he graduates. However, the ensign is the true stakeholder because the midshipman is

not the product handed over to the organization. For the remainder of this paper, JO will refer to the group of officers holding the rank of ensign (O-1) through Lieutenant (O-3) who have served, or are serving on, a submarine. The JO is concerned with issues beyond immediate training goals, including the ability to perform capably under the pressures of a real environment as well as preparing for further skill acquisition and advancement.

2. The Fleet: The United States Submarine Service

The second stakeholder is the future employer that relies on the training system to develop the requisite level of competency in the learner to enable the learner to perform his job (Jeffery & Bratton-Jeffery, 2004). In this research, that employer is the United States Submarine Service, specifically, the command that inherits the newly commissioned ensign. For the remainder of the paper, the second group of stakeholders will simply be referred to as the Fleet. This group consists of personnel in a pay grade equal to, or greater than, O-5 (Commander or above). These participants are concerned with the product of the initial training command because they are responsible for follow-on training and education of the JO group and must compensate for any shortcomings of previous training commands. Fleet participants are either serving, or have served, as the Commanding Officer (CO) of a submarine. The CO is responsible for the evaluation and ranking (consequently the career progression) of his JOs. The researcher felt that, with the constraints involved, COs' opinions on the training and education of those in their charge would be sufficient to meet the stakeholder requirements.

3. USNA: The United States Naval Academy

The third stakeholder group for this research is the United States Naval Academy, the entity responsible for the actual training and educational mission. Concerns for this stakeholder include competency requirements, time to train and training constraints such as overhead or infrastructure cost as well as technological limitations (Jeffery & Bratton-Jeffery, 2004). Participants in this group consist of personnel responsible for training and education duties at the Naval Academy. There are two distinct groups the researcher believed necessary to have as participants. The first group consists of the Distinguished Military Professors (DMPs). The second group is comprised of instructors who teach the NL402 course. They do not fit precisely in the stakeholder category but are instrumental in seeing that the vision of the USNA stakeholders becomes a reality. These are submarine-qualified officers on the yard who have experience acting in mentorship or supervisory roles. For the remainder of this paper this collective group will be referred to as USNA, unless specifically stated otherwise.

D. SELECTION OF STUDY PARTICIPANTS

This section describes the demographics of the participants. All participants were involved in either an individual interview or a focus group. The J0s and the Fleet completed surveys. Both the interview protocol and the survey protocol are described later.

All of the participants were chosen by the researcher. The benefit of interviewing two groups, the J0s and the Fleet, was that the researcher belongs to the J0 group and

aspire to the Fleet and is therefore able to gain unique and virtually unlimited access to information. Due to the secretive nature of submarine operations, schedules are never available for which boats are going to be in-port and accessible, so the researcher had to choose the participants based on, essentially, a convenience sample.

The JO group includes 14 members from three different commissioning sources; The Naval Academy, Naval Reserve Officer Training Corps (NROTC) and Officer Candidate School (OCS). They are all designated as unrestricted line submarine officers (117X for officers in the training pipeline, 112X for fully qualified submariners) and hold the ranks of ensign (O-1), lieutenant junior-grade (O-2) or lieutenant (O-3). Their time onboard the submarine ranged from two weeks to 25 months. The typical JO tour is 32 to 36 months. The only officers interviewed were those who had served in a division officer billet because they had experienced dealing with superiors and subordinates on a daily basis. A division officer, in addition to watch standing and maintaining divisional equipment, is responsible for the training and welfare of the personnel assigned to his division. Table 3 illustrates the JO stakeholder group.

JO Interview Participants		
Rank	Commissioning Source	Time onboard
O-1	3 USNA / 2 NROTC	2 weeks-4 months
O-2	4 USNA / 2 NROTC / 1 OCS	6 – 24 months
O-3	2 USNA	30-36 months
Total	9 USNA / 4 NROTC / 1 OCS	

Table 3. JO stakeholder interview participants

COs interviewed included four serving commanders (O-5) and three post-command captains (O-6). The seven COs graduated from either The Naval Academy or NROTC units. The command tour is typically 36 months and the serving COs had been onboard from 19 to 29 months. Table 4 illustrates the Fleet stakeholder group.

Fleet Interview Participants		
Rank	Commissioning Source	Current Position
O-5	3 USNA / 1 NROTC	CO, Pearl Harbor, HI
O-6	2 USNA / 1 NROTC	2 stationed at USNA 1 stationed at Pentagon
Total	5 USNA / 2 NROTC	

Table 4. Fleet stakeholder interview participants

The USNA group is crucial to the validity of the research. In addition to acting as stakeholders, these participants also act as Subject Matter Experts (SMEs) in the field of leadership education. The group is comprised of six ODEV DMPs and Permanent Military Professors (PMPs), the Chairman of the Leadership Ethics and Law Department and three researchers. These individuals are engaged in curriculum design and implementation within the ODEV Division. All participants hold master's degrees and all but two hold doctorates of philosophy. Two participants are serving on active duty, three are retired military officers, one is serving in the U.S. Marine Corps Reserve as a Colonel and all have experienced command in the U.S. Military (Cox, 2007). If successful instructional design is to occur, this stakeholder input is invaluable.

The other sector groups of USNA, the NL402 instructors and the mentors/supervisors around the Naval Academy, are not trained in leadership education, but have enough of a stake in the program to offer valuable input on the direction of the course. They are comprised of four post-JO tour lieutenants, one post department head lieutenant commander (O-4) and two post-command tour captains (O-6). All of these individuals are graduates of The Naval Academy.

E. METHODS FOR COLLECTING AND ANALYZING DATA

Methods of data collection for this research include interviews and a survey. The interview protocol and survey development are described below.

1. Interview Protocol

The interviews conducted were of two categories, semi-structured and focus group. The semi-structured interviews were developed with the assistance of research advisors and in collaboration with Lieutenant Cox, USN, who is conducting thesis research similar to the present effort. Lieutenant Cox's area of interest is the appropriate capstone course development for the surface warfare community. The focus group that was conducted for this research was also done in collaboration with Lieutenant Cox. This is important in that both research products have common stakeholders. Consistency in research methods and interview protocol will, hopefully, eliminate researcher bias towards specific service communities. Commonalities are produced when similar methods are used in the data collection process, and this will benefit both the Naval Academy and the naval service.

All officers interviewed for this research were serving (or had served) onboard submarines and had at least some operational experience. Most of the interviewees are Naval Academy graduates and have been through a version of the leadership continuum as well as the maritime continuum. The officers commissioned through NROTC participated in something similar to the Naval Academy experience, but without its depth. There is currently no submarine-specific capstone or practicum at the NROTC units of those interviewed. The purpose of the interviews was to explore the needs of each of the stakeholder groups. This raw data was then transcribed and themes that emerged were identified.

a. JO Interviews

The interviews were all semi-structured with five initial questions, each open-ended, with the interviewer soliciting more in-depth commentary when new topics or themes arose. The interviews began with a basic introduction, the purpose of the research and the goals of the interview. After that, each JO received the same initial question and the interviews progressed from that point. Each was scheduled for thirty minutes and all were digitally recorded. Each interview was transcribed and all participants were given the researcher's contact information in case they thought of anything else they wanted to share for the research. This interview protocol is presented in Appendix A.

b. Fleet Interviews

The Fleet interviews were similar to the JO interviews. The Fleet was asked to compare and contrast their subordinates based on their separate accession sources. This data was unique to the CO group and allowed for a much broader inspection of the JO KSAAs. The Fleet interview protocol can be found in Appendix B.

c. USNA Interviews

The USNA interviews were conducted with course instructors and coordinators in order to obtain a sense of how well the vision of the NL402 course translates to reality. The interviewer made sure, in order to limit any bias associated with teaching the course, to base the interview queries strictly on the course syllabus.

2. DMP Focus Group

The only focus group conducted for this research was established in collaboration with the aforementioned research project, which shares similarities with this one. The other researcher, Lieutenant Cox, also conducted a needs analysis for NL401: Surface Warfare Officer Capstone.

3. Survey Data

Survey data was collected in order to provide a hierarchy of needs for the JO and Fleet stakeholders. A list of the core competencies for a JO reporting onboard to his first command was provided to each stakeholder group. These competencies come strictly from what is currently being taught to the midshipmen under the capstone program. The competencies taught in the current capstone course can be found in Appendices A and B. The JO participants were asked two questions relating to these competencies:

- After leaving the training pipeline (SOBC graduation), but prior to coming to the boat, how important did you feel these competencies were to your success as a JO?
- How prepared did you feel you actually were in each of these areas?

These competencies were ranked on a graphic scale with 1 being "very low" and 4 being "very high" (Fink, 2006). The Fleet participants were asked the same questions, as they applied to the JOs (i.e., How relevant are these competencies to a new JO? How prepared are your JOs in these core areas?). The Fleet used the same graphic scale as the JOs.

A frequency distribution allowed the researcher to explore which competencies included in the NL402 course are

most important in the eyes of the JO and Fleet stakeholders. The survey proved useful in providing initial themes. The interviews were conducted afterwards to identify additional themes, as well as provide supporting or contradicting data to the themes established by the survey.

F. CHAPTER SUMMARY

This chapter provides a detailed discussion of the methodology used in this research. This chapter also presents the stakeholders and an explanation of why each group was chosen and what their contribution to this research comprises. Along with the participants, the data collection methods are introduced in their basic form and will be elaborated upon in the next chapter. Using the information collected from the participants and employed in the various models, the next chapter presents the results of the relationships that can improve the training and education of future submarine officers.

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V. RESULTS

A. CHAPTER OVERVIEW

This chapter presents the results of the interviews, surveys and focus groups. All interviews were transcribed and coded according to the recurring themes that arose from the responses offered. Respondent commentary is presented to support the researcher's themes. Results are reported using the following nomenclature to refer to the number of respondents agreeing with a particular theme:

- All - One-hundred percent of respondents
- Most - Roughly seventy-five to one-hundred percent of respondents
- Half - Fifty to seventy-five percent of respondents
- Some - Roughly twenty-five to fifty percent of respondents
- None/No - Zero respondents

The chapter is organized into four sections; JO data, Fleet data, USNA data, and a summary of the themes presented.

B. JO DATA

It is very important to reiterate that the JO's training pipeline, from the point they graduate to the point they step onboard, is very heavily concentrated around nuclear propulsion theory and operation. Two JOs said of the nuclear propulsion pipeline:

I don't think the submarine force really needs their ensigns to know anything about fluffy leadership stuff. They just want you to get back

to the box, and get hot with quals. I don't even think I saw the front of the boat, except to eat and sleep.¹

Nuke propulsion is it! If you aren't a good nuke, you aren't a good officer in the eyes of the men.

These sentiments about nuclear propulsion training are important because although it is a significant part of a submarine officer's professional development, there is hardly any mention of it during the interviews. Everyone involved assumes that the JO will have the requisite knowledge, skills and abilities to survive the nuclear propulsion demands placed on him upon arrival.

This assumption comes from data collected early in the survey formation phase. The original initial question in the pilot interview was "What were you most prepared for when you stepped onboard the submarine for the first time?" When all of the respondents stated "the nuclear propulsion qualification process," this question was rephrased to ask "Besides nuclear propulsion, what were you most prepared for when stepping onboard?"

The researcher found that each respondent group felt the same towards JO preparedness for the nuclear propulsion aspect of submarine operations. All of the Fleet participants expressed the same sentiments about nuclear propulsion as the JO participants. Three COs said:

The nuclear side of the house takes care of itself. There are a bunch of smart people in DC making sure that the proper quality control is maintained on our input. What we need to get them to do is remember all the OTHER stuff.

¹ The box is a slang term for the "Maneuvering Area" of the submarine, which is a small space where one officer and three enlisted personnel maintain positive control of the nuclear reactor.

JOs understand nuclear propulsion. They have to or they won't make it through the pipeline. The frustrating part is when they get bogged down with everything else required of a JO, their nuke stuff also suffers.

These results show that nuclear propulsion training is a significant part of junior officer life onboard a submarine; however, the stakeholders feel that the training that takes place after graduation is sufficient. Therefore, nuclear propulsion training was not included as a theme. The themes this research focused on are ones specifically relevant to the capstone course.

The research is interested in improving the preparedness of submarine junior officers when they step onboard; therefore, the initial interest focused on competencies for which they felt unprepared. Although there were multiple comments on competencies that JOs thought were important, yet still arrived unprepared for, two main themes emerged from the survey data. Those themes were (Very Important AND Not Prepared):

1. The administration of maintenance onboard, specifically: Preventative Maintenance System (PMS), Tag-outs and the Submarine Safety (SUBSAFE) system.
2. Responsibilities of a junior officer.

From the survey, the JOs felt that PMS, SUBSAFE and tagout, as well as understanding of JO life, were very important competencies and the ones that they were the least prepared to handle. These two themes were validated with JO interviews.

1. Maintenance Administration

The following statements came from JOs pertaining to PMS, tagouts and the SUBSAFE program. These programs are grouped together because they are all maintenance related, and maintenance training and education seem to comprise the dominant need:

I do not know how much you can teach about it, but some kind of decent overview would help.

I was not prepared for any PMS, tagouts, or SUBSAFE stuff, which is odd because of how important it is onboard

It is probably difficult to motivate students to learn about something they have no experience with, but training on work controls...would be beneficial as part of a capstone course.

A small amount of maintenance training does exist in the pipeline while the JO is in the Submarine Officer Basic Course (SOBC). However, the effectiveness of the instruction, or the interest of the learners may affect how worthwhile it is. One JO said:

People are talking about 2-Limas and 2-Kilos, but we are two weeks away from graduation and people could not give a [expletive deleted]. The instructors even say, "If you do not understand, you will figure it out when you get to your boat."

The answer may not be to implement maintenance training at the commissioning source, as suggested by another JO:

Learning that stuff [maintenance] when you are so far detached from the fleet is ridiculous; no one cares, we just want to graduate and get to nuke school.

All of the JOs felt they were unprepared for the emphasis placed on PMS. Most of them suggested that a more robust training program would leave them better prepared; however, some felt that being unprepared was justified and a part of the "growing pains" of being a new JO.

2. JO Life

These growing pains are the next competency that JOs knew to be important, but were still unprepared for when they stepped onboard. The life of a JO has a few sub-themes within it that must be explained in order to fully understand the requirement. JO life consists of the combination of several duties onboard. Most important among them are those of the division officer and those of the qualifying watch stander.

a. *The Division Officer*

The division officer is responsible for all aspects of his divisional program. He usually works with a Chief Petty Officer in the execution of programs that include personnel management, training, maintenance, evaluation and the counseling and development of subordinates. About the transition to becoming a division officer, JOs stated:

How people communicate with you is different once you step onboard. In nuke school, it's "do this" and you go do it. Here, it's like some kind of "Message to Garcia" thing. They expect you to find out WHAT your job is, what it entails and then expect you to go out and figure out the best way to do it. You only hear about it when you are somehow doing a job you don't really know how to do anyway, the wrong way.

The Naval Academy kind of glamorizes submarine JO life. The whole Academy is geared towards war-fighting, and being this great tactician; while, in reality, you are sitting back in the engine room, monitoring maintenance and supervising field-day of your divisional spaces.

The same JO later said:

I will be back in the engine room with my division until the end of deployment, then we are going to DMP (Depot Modernization Period, an intensive shipyard period), and it looks like my entire three-year career is going to be all engineering. I am a poly-sci major; I signed up to do all that war-fighting they showed me! But I would still do this again, I just wish I knew exactly what my role would be.

b. The Watch Stander

The watch stander role consists of qualifying for and standing watch at stations throughout the boat. This requirement is not separate from the division officer role, and requires the JO to split his time efficiently between the two. These watch stations take anywhere from one week to two years to qualify for and range in level of responsibilities. JOs found this to be a demanding time in their transition process and most JOs noted it as the competency that they were least prepared for. JOs remarked:

Getting underway, its one thing to hear about JO life underway, but its another thing to be Engineering Officer of the Watch (EOOW) under instruction on the mid-watch, and you can't sit down, so you are falling asleep standing up, and you know you have to go stand periscope assistant after this, and you are thinking to yourself: when am I ever going to sleep? People tell you that you are going to hate your life, and you will never sleep, and you will be juggling chainsaws with your guys, your division, and your

quals, but there is no way words can replace the experience. I do not think there is any type of training or education you could do to fix that, or make that real.

Stepping into being a JO was like climbing Mount Everest alone, blind-folded, and in your underwear. But at least I made it, I think?!

I did not have very realistic expectations of what it would be like on the sub. A better warning about the intensive qual process and all the responsibilities would help.

My first job was Junior Officer of the watch, but I knew very little about how to use the fire control or sonar equipment or any info it gave me. In port, I was an Engineering Duty Officer, but I was clueless about work controls and managing personnel and maintenance.

It should be noted that the interviewer was picking up non-verbal cues that the JOs were actually excited about the hardships that they were going through or had gone through. Half of the time, JOs would go into elaborate tangents about how they hated it, but it was clear that they knew they were better for it. Two different JOs remarked:

You can not let it [JO life] get to you. We all knew it would suck when we signed up and took their money. That's whey they pay us!

I think sitting in Annapolis for four years having every moment of my life controlled and changed at the drop of a hat prepared me for the ever changing dynamic life of a being a JO in Hawaii.

The Fleet was the other group of stakeholders who participated in the survey. Their responses and interview data are included in the next section.

C. FLEET DATA

The Fleet stakeholder group consists of COs and post-command O-6s who are responsible for the professional development of JOs after they leave the training pipeline. What these participants brought to the research was a critical eye on preparedness of JOs from a direct supervisory view. The JO understands what he thinks is important prior to reporting onboard, and the CO is the one who actually decides how each JO is performing to the standard. One CO pointed out that it is his job to "evaluate and prioritize for my JOs where they need to focus their efforts for improvement."

The CO survey is similar to the JO survey; the questions are just asked from a different perspective. The survey was used in collaboration with interviews in order to determine the requirements of the Fleet. The themes that emerged from this group are:

1. Division officer responsibilities.
2. Basic seamanship and JO responsibilities.

The predominant themes from the Fleet participant survey and interviews revolved around two sets of core competencies. The first was general division officer responsibilities. Sub-sets within this core were written and oral communications, personnel administration, development of subordinates and officer-enlisted relations. The second group consisted of general knowledge; including basic seamanship, life as a JO and the JO decision making process. The Fleet felt that the JOs should have been more prepared in these areas because of the significance of these skills to the role as a JO onboard.

1. Division Officer Responsibilities

Pertaining to division officer responsibilities, there was clearly a strong feeling that communications and the officer-enlisted relationships were areas where the JOs needed improvement. Some COs mentioned personnel administration and development of subordinates, but half of the COs agreed that written and oral communications of their JOs were not of the caliber they (COs) expects and demands. Communication includes listening, as one CO stated:

These guys have to have the ability to listen. A lot of times they talk when they shouldn't. I don't know if it's because they feel nervous, or think they sound smart or what.

COs commented about the communication skills required of a JO:

They have to be good communicators. They have to be able to talk to their troops, they have to be able to come in and talk to the XO and CO. They have to be able to stand up in front of a group and not sound like an idiot.

I never knew how to write messages as a JO. I didn't learn until I got tired of the XO coming back and telling me it was messed up. That's when I went and got the correspondence manual and figured out how it was supposed to be done...I think that is certainly something we can teach them here [The Naval Academy]

The COs see effective communication skills as an essential requirement to the success in the JOs' roles as division officers. The problem is that most JOs believed they were prepared for written and oral communications. This clearly shows a gap that some COs think can be addressed prior to the JO stepping onboard.

The second area of concern centers on the COs' observations that their JOs sometimes struggle with the officer-enlisted relationships. COs stated:

What it comes down they have to have the intestinal fortitude to set a standard and uphold it. If they can do that, they will be successful.

The biggest thing JOs struggle with is that they want to be everyone's friend and please everyone. Instead of recognizing that their job is taking care of their men, they want to befriend them. It doesn't really matter where they come from. It's a difficult boundary to break. I don't know where it comes from.

I know some JOs struggle with how to handle themselves around the enlisted, especially early-on. The qual process relies on them having a good rapport with the men, but there are limits that some JOs toe and sometimes step over.

I never really saw the JOs struggling with that [relations]. I heard it more from the Chiefs and Chief-of-the-boat (COB) that certain JOs didn't understand what the Chief's role was, and how to best utilize that relationship. I take that as more of a personality problem as opposed to a true training problem that needs to be addressed.

All JOs figure out that balance between friend and subordinate, some just take longer than others. The [submarine] fleet is good about making sure that happens.

Most COs indicated that the JOs required some sort of extra instruction on how to deal with the enlisted personnel onboard. When probed, most COs felt that this was a problem that could only be worked out in the real-time environment. This means that, although the COs recognized a deficiency, most felt that on-the-job training was the most effective way to supplant that deficiency.

An interesting finding was that the COs felt watch standing was not an important core competency to teach the JOs in a practicum course. Several COs stated this pertaining to watch standing duties and responsibilities:

Prototype prepares them to be capable watch standers. You can't tell someone how to stand a proper watch. You can give them general watch standing principles, but Academy guys learn that from standing Mate and CDO. They know what they have to do; it's whether or not they WANT to do the right thing all the time.

USNA guys are much more comfortable with the watch standing principles, the formalities, the Chain-of-Command. In general, they are just more comfortable with the military aspect of watch standing because they have been doing it since Plebe summer.

I think watch standing, like the act of being there and having a questioning attitude, is where the JOs really earn their salt. That is what I really need them to be able to do when they are brand new anyway. I know that they are so worried about doing everything right that they will, hopefully, ask the questions that have to be asked, and not be scared to get help.

This theme did not emerge as a requirement for JOs, but rather as another validation that the nuclear training pipeline and along with USNA experiences, prepare the JOs to be successful watch standers.

2. Basic Seamanship and JO Responsibilities

The second group of core competencies that COs felt JOs struggled with included basic seamanship and the transition from midshipman life to life as a junior officer. The Fleet felt that these competencies were the exact areas on which the Naval Academy should focused. COs stated:

I want a JO to come in with a good solid basic knowledge of seamanship and rules of the road and navigation. It's important that they have this base so that when they finally do come forward, they have something to draw upon.

This may be a data point of one, but the first time I had a new Naval Academy grad on the bridge to drive the boat in, I thought alright, he is a Naval Academy grad, he should do alright. He couldn't get an order to the Helm to save his life. I couldn't believe it. I guess I would expect someone coming from the Naval Academy to be able to give basic ship-handling commands.

From the Fleet perspective this is what the COs had to say about the qualification process as it pertains to the life of a JO:

They need to have the ability to handle large quantities of data and info and to be able to digest it and understand it, without getting overwhelmed or inundated.

The JO needs to be able to figure out what is important to the mission of this boat and get onboard with that. He has to buy into the fact that what he DOES NOT do, hurts more than himself. JOs are so used to being on their own in the pipeline, that it sometimes takes them a little bit, and sometimes a boot in the ass, to realize that they are not college kids anymore or midshipmen or whatever. They are officers in the Navy and need to act as such.

The last theme pertained directly to the capstone course at the Naval Academy. The researcher asked COs to comment on the concept of a dome or a spire structured course as mentioned in Chapter III. The responses were overwhelmingly positive towards a spire structured course, and negative towards a dome structured course. The Fleet group made the following comments:

What is it that your leadership department wants to teach them that they haven't already learned? They just need to get out there and get some experience now. They can still read and learn from talking to senior officers, but I don't know how much more leadership training is required beyond four years in Annapolis.

I think that the readings and lessons the Midshipmen take early on in their time there could be reviewed. But, if you are waiting until the second semester of their senior year, I think you are in trouble. They need to internalize those leadership traits that they hear over and over again, and take it on themselves to become better leaders in the sense of book smartness. Let us [Fleet] teach them to be leaders of men.

These quotes support the Fleet's themes that time in the classroom should not focus on leadership education; but rather, it should focus on practical training centered on the core competencies of JO life. The next section is dedicated to those stakeholders who have direct input into how exactly that limited classroom time is spent.

D. USNA DATA

The final stakeholder group is the USNA group. This group is comprised of the ODEV focus group members and instructors of the NL402 course. This stakeholder group will ultimately be faced with implementing any changes recommended by this research, so soliciting their input became as important as the JO and Fleet responses.

The DMP/PMP sector group was not given a survey because only one of them is a member of the submarine community. The researcher determined that the sector groups' opinion of specific submarine JO requirements would skew the results. Therefore, this group only answered

questions pertaining to course design and to the KSAAs they believed necessary for JOs reporting to their first commands. Because the focus group was done in conjunction with those not interested specifically in the NL402 course, the themes are more generic and focused towards the previously mentioned discussion of whether a "spire" or "dome" structure would be a more beneficial way to design the course. This group is unique in that it is responsible for staying within the credit structure of the Naval Academy; while they are responsible to the entire submarine fleet to providing the best product possible.

The themes of the USNA group were difficult to distill due to the split educational backgrounds as well as the focus of this stakeholder group. Adding to this difficulty is the desire to frame their needs in terms of course design: the dome or the spire. In order to arrive at a workable set of themes, the researcher took the instructor responses out of the discussion of course design. The attitudes and abilities of JOs teaching the course are as variable as are those of the students. The researcher is interested in the aspect of improving junior officer preparation and that can be addressed with better course design. Therefore, the researcher put the onus of educating or training the midshipmen on the course architects. The theme that emerged from this group was:

- Design a course (Dome or Spire) that involves character development and is adaptable to the ever-changing issues of the world.

On the decision whether it should be a spire or dome structured course, the DMPs were split. Some saw it strictly as a dome, and put it in terms of a "final battle problem" that takes into account everything the midshipmen

were exposed to over their three years at the Naval Academy. One DMP stated this problem "would be a confidence builder," and another expressed the notion that this could make "them feel more like commissioned officers, and less like midshipmen." However, another DMP said:

We are under a significant amount of pressure to make the curriculum more midshipmen focused, more focused on the midshipman experience. I think the right thing to do is make it more fleet focused. And I think the answer may be to do both...I think we can do both.

One DMP made a profound statement that provided the general direction for the requirements analysis:

When Junior Officers fail, when they are fired, and bring discredit upon themselves, the Navy or Marine Corps and the Naval Academy, it is for character related issues, not performance.

Another DMP echoed this sentiment:

We get embarrassed by our bottom few...we are judged on those few mids.

The DMP/PMP group believes that character training is more important to the soon-to-be junior officer than is practical training. This supports the thought among the DMPs that the way of the future includes understanding elements outside of the traditional rules of the road, and basic military knowledge. The adaptability of the course design emerged from answers like this one from a DMP illustrating how understanding geopolitical situations may soon be the norm:

The decision of whether or not to arm your Marines or sailors with weapons as they go into Indonesia because of the political ramifications...they weren't worried about that in 1940. We are. And that is going to become even

more so as young officers are having to make those kinds of decisions when they are sent out as task force commanders...and these guys are going to be very involved with unique circumstances that have very little to do with what we are used to doing.

Whether designed as a spire or dome, all of the DMPs believed that some sort of synthesis needs to occur prior to graduation, that forces the midshipmen to bring together all of the skills and knowledge they can. One DMP stated:

If the synthesis and integration, if you do it properly, and it captures what you want...most undergraduates never put it together. Most undergraduates take courses in their own little silos...any notion of a capstone that makes any undergraduate integrate, synthesize, bring together is a unique educational experience that is rarely done. So, to say that it's a dome is accurate; to say that it's a spire is also accurate.

Although the particular themes and metrics are difficult to identify out of this group, the overall consensus is that JO preparation can improve in the classroom at USNA. One major problem that arose during the interviews with the instructors was the subjectivity of the course content. One instructor stated:

The course is just not well-defined enough. I have a syllabus, but it fills up, like 50% of the time allotted. So now either I let them go early, watch movies, or tell sea-stories to the half of the class that is awake.

Another instructor had similar thoughts, and seemed almost defeated when he explained:

I just don't know what to do up there. I can only tell so many sea stories. It's not like I am a teacher. I think I could do better, but I don't think it would make a difference either way.

These last quotes demonstrate that if capable, well-trained instructors are not selected, few of the needs of the stakeholders will ever be met. Whichever approach the course architects chose, it is the instructors who will provide the knowledge, skills, abilities and attitudes necessary for the JO to succeed at his initial assignment.

E. SUMMARY OF RESULTS

In summary, the needs were very consistent across the stakeholder groups. All of the groups agree that the nuclear propulsion pipeline takes care of itself. The consensus is that the pipeline does an excellent job of preparing JOs and that "there is no need to give us anymore nuclear propulsion training than we already receive," as stated plainly by one JO.

As far as the JOs are concerned, two themes emerged. First, most felt that for being such a large part of their original responsibilities, PMS, tag-outs and SUBSAFE should be afforded a larger proportion of training time prior to arriving onboard. Second, all JOs generally understand the submarine's mission, but do not understand how they will fit into that mission. One JO spoke for most by stating:

I hear everyone talking about these maintenance periods and different shipyard periods, and I have NO clue what they are talking about.

Essentially, most JOs require a better means of preparing themselves for the JO lifestyle onboard a submarine. In reference to NL402, one JO said:

...we discuss leadership and leadership styles and what it's going to be like, but you just kind of hope that it sticks in...some of it does, some doesn't.

Another JO had a different outlook. He said:

...yeah it sticks with you, making decisions and giving orders come pretty naturally after the Academy.

The Fleet requirements focus on JOs having a strong foundation in communication skills, basic seamanship skills and a grasp on general division officer responsibilities. The Fleet stakeholder groups shared a common sentiment with the JO group that, for the most part, JOs are not prepared to meet the expectations set forth by the COs. Overall, COs want the JO to be better prepared to step into the role of a Division Officer and have a better grasp of basic seamanship. Specifically, COs want to see improved communication skills, better relations with the enlisted and a clearer understanding of the competencies on which they will be evaluated.

Finally, the USNA themes are the only needs taken into account for instructional design purposes. The course instructors had valuable input into turning the course vision into a reality, which will be discussed in Chapter VI. The DMP themes include the establishment of a synthesized, culminating leadership experience that produces graduates of strong moral and ethical character who will not embarrass the Naval Academy and are well rounded with the ability to face the ever-changing roles of the professional military officer. This can be done via

the "spire" or "dome" method. However, the instructors are the only ones that can actually see this vision to fruition.

F. CHAPTER REVIEW

This chapter presents the themes identified from each of the stakeholder groups. The data collected through interviews, surveys and focus groups was coded and presented in the form of these themes. These results are now used in the next chapter to identify conclusions and make recommendations to the Naval Academy.

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VI. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

This section presents conclusions drawn from the data analysis, results and summarization of themes. The first group presented is the JO stakeholder group. Conclusions and recommendations concerning this group are followed by parallel information concerning the Fleet stakeholders. The USNA stakeholder group provides the final set of conclusions. The final section of this chapter offers recommendations drawn from the conclusions.

1. Conclusions from JO Stakeholder Group

Conclusions emerged from each of the three themes identified by the JO group. These themes concerned nuclear propulsion training, maintenance administration and responsibilities handled by junior officers. The following paragraphs present specific conclusions relating to each theme.

a. *Nuclear Propulsion Training*

The JO group responses demonstrate that all JOs believe the nuclear propulsion training pipeline provided them with excellent preparation to assume their responsibilities in that area. This pipeline provides the proper balance of education and training, giving the JO confidence to perform well. Each of the other stakeholder groups echoed this sentiment, leading to the conclusion that nothing needs to be done to the current capstone course to improve a JO's ability to perform well at nuclear propulsion related tasks.

b. Maintenance Administration

All of the JOs felt unprepared for the amount of maintenance administration for which they are immediately responsible onboard. They had been exposed to it in a limited capacity, and some knew minor details; but, considering that this is such a significant part of JO responsibility, the topic was not addressed in sufficient depth or detail prior to the JO assuming his duties onboard. The data support that JOs do not believe this topic is adequately presented because, throughout the pipeline, instructors do not focus on teaching this aspect of JO responsibility.

c. Responsibilities of a Junior Officer

Most of the JOs felt the role of a junior officer on a submarine was not clearly defined. While taking the Capstone course, the responsibilities of a junior officer are not identified as two distinct jobs: the division officer and the watch stander. These roles have nothing to do with each other, yet both job performances are equally important in how the JO is perceived.

There was a stronger emphasis placed on understanding the role as a division officer than there was on that of a watch stander. This is due, in part, to the fact that Midshipmen are constantly exposed to the "war-fighter" mentality of driving submarines. They understand what driving and fighting the submarine entails, but are rarely exposed to the unspectacular preparation that allows the driving and fighting to occur.

2. Conclusions from Fleet Stakeholder Group

The Fleet stakeholder group's results show that the group is interested in having JOs capable of performing at-sea as division officers and ship-drivers beginning with the day they step onboard. Therefore, the conclusions have a direct focus on capstone course improvement. Conclusions from this group were that four-year maritime and leadership continua should produce fully capable JOs who are both grounded and confident in practicalities as well as theory.

a. Problems with the Leadership Continuum

As stated in Chapter II, these core courses help the midshipmen develop their personal leadership styles by providing the necessary principles of law, psychology, leadership, ethics and philosophy. It is clear from the Fleet responses that JO preparedness for dealing with enlisted personnel is an issue that should be underscored within this continuum. The courses indicated in Chapter II clearly identify that which the Fleet deems as basic division officer responsibilities. Although all areas are addressed, they do not seem to impart an equally acceptable impact of confidence on the JOs and their immediate shipboard performance.

b. Problems with the Maritime Continuum

The Fleet sees a larger problem with JO preparedness in areas of basic seamanship. COs expect that JOs coming from the United States Naval Academy will be able to give basic commands to watch standers. Inefficiency or inability to do this presents a clear problem that can be addressed and solved through the

Maritime continuum. As noted in Chapter II, these concepts are reinforced through summer training and courses that emphasize hands-on training.

3. Conclusions from USNA Stakeholder Group

The USNA stakeholder group, although the most diverse, focused entirely on one aspect; that of course design. Thoughts specific to course design and not limited to syllabus content emerged from this group. However, there was no clear consensus about which course structure, dome or spire, would best benefit all stakeholders. The conclusion here is that there needs to be more study addressing this issue.

B. RECOMMENDATIONS

1. Maintenance Administration

A solution to this situation is not immediately apparent. While the data support that learning how to run the maintenance programs requires a hands-on approach, there is no reasonable expectation of providing that skill-set in a traditional classroom environment. The current course presents only a cursory overview of maintenance.

The recommendation is to keep the overview and add a concentrated section with specific directives about when and how to use the documents involved with the maintenance process. In this way, the JOs will at least know what to expect, even if they are at first unsure of how best to apply the knowledge.

2. Responsibilities of a Junior Officer

The recommendation is to expand and deepen the portion of the current course that entails the responsibilities of

junior officers. This is possible with explicit direction to the instructors on how to most thoroughly inform the midshipmen. The participating instructors expressed that the majority of classroom time is spent telling sea-stories. With a more robust syllabus, better testing and more candid feedback, the course coordinators will be able to correct this situation.

3. Curriculum Recommendations

The leadership and maritime continua are useful tools if employed properly. They both provide the proper foundation necessary for both the capstone course and the transition from midshipman to junior officer. The Fleet and USNA recommendation is to take the structure already in place and improve on it. The way to proper course design, as stated in Chapter III, is through an in-depth needs analysis. More research into JO preparedness based on the findings here will help to narrow the basis of the needs analysis.

C. CHAPTER SUMMARY

This study has clarified for the researcher that all three stakeholder groups have valid concerns about the efficacy of the current training program for midshipmen entering the submarine service. All stakeholders are also in agreement on the area of training that exhibits excellence. The goal is, as it should be, to impart all of the knowledge, skills, aptitude and attitudes midshipmen need to perform with total confidence immediately upon their arrival onboard. In order to achieve this goal, the following must occur:

(1) Determine the best method of imparting the level of preparedness in all sectors of the training that exists in the nuclear propulsion pipeline.

(2) Create a teaching guide for course instructors.

(3) Install an effective assessment tool that accurately predicts performance readiness.

(4) Create a feedback mechanism that will keep course material vital and relevant for each new class.

Familiarity with the objectives is insufficient for the stakeholders to have total confidence in the JO; there must be facility. Changing and upgrading the course will accomplish that end and will enable future JOs to arrive onboard and act with confidence in all areas.

APPENDIX A

JO Questionnaire XXX JAN 2006

Purpose: The purpose of this survey is to determine the knowledge, skills and ability needs of an Ensign reporting onboard his first boat. Pre-Commissioning Submarine Candidate training is being reevaluated. The results of this survey and research will have direct implications to changes in Submarine specific training events.

1. Besides Nuclear power, what are junior officers most prepared for when reporting to the boat?
2. What are junior officers least prepared for as they start their tour?
3. Are there areas of Pre-Commissioning training that you feel can help you prior to reporting onboard?
4. What do you believe the core competencies to be for a new junior officer reporting onboard to be?

The following questions were asked for demographics:

5. What was your accession source? USNA_____ ROTC_____ Other_____
6. Were you prior Enlisted? Yes_____ No_____
7. How long have you been onboard?
_____ months
8. Which Division are you assigned to?

(The one you have been in the longest)

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APPENDIX B

Submarine Training and Education Core Competencies

JO GROUP XXX JAN 06

Rank_____

Hull Number_____

Please Rate the following competencies by the level of importance for an Ensign to understand when reporting onboard. Please also rate their level of preparedness in these areas.

Example - If you think The Rules of the Road are important for a new Ensign, then mark it "3" or "4" in the importance column; and if you feel that they are not prepared for the Rules of the Road then mark a "1" or "2" in the Preparedness column.

IMPORTANCE		PREPAREDNESS	
VERY LOW	VERY HIGH	VERY LOW	VERY HIGH
1 ----- 4		1 ----- 4	
	Rules of the Road		
	Target Motion Analysis		
	Navigation		
	Sonar Employment		
	Written Communications		
	Verbal Communications		
	Counseling Skills and Techniques		
	Enlisted Relations		
	FITREP Preparation		
	Developing Subordinates		
	Customs/Courtesies/Traditions		
	Professional Military Ethics		
	Security of Classified Material		
	SUBSAFE/Tagout Systems		
	Preventative Maintenance System		
	Foreign Submarine/Emerging Technologies		
	Personnel Administration		
	Financial Management		
	Military Law		
	Life as a Junior Officer		
	Decision Making Process		

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APPENDIX C

FLEET Questionnaire XXX JAN 2006

Hull Number_____

YR Group_____

Purpose: The purpose for this survey is to determine the knowledge, skills and ability needs of an Ensign reporting onboard his first boat. Pre-Commissioning Submarine Candidate training is being reevaluated. The results of this survey and research will have direct implications to changes in Submarine specific training events. ALL PARTICIPANTS WILL BE KEPT ANONYMOUS

1. What is your position onboard?
2. How long have you been onboard? _____months
3. What was your commissioning source? USNA_____ ROTC_____ OCS_____
4. What are the most important knowledge, skills and abilities that an Ensign should have prior to reporting onboard?
5. In general, what areas of the adaptation process do Ensigns struggle with most?
6. Of those areas, do Ensigns from the United States Naval Academy struggle any more or less than officers from other commissioning sources?
7. What areas do the Ensigns from the Academy display strength compared to other commissioning sources?

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APPENDIX D

Submarine Training and Education Core Competencies FLEET XXX JAN 06

Rank_____

Hull Number_____

Please Rate the following knowledge, skills and ability areas by the level of importance for an Ensign to understand when reporting onboard. Please also rate their level of preparedness in these areas.

Example - If you think The Rules of the Road are important for a new Ensign, then mark it "3" or "4" in the importance column; and if you feel that they are not prepared for the Rules of the Road then mark a "1" or "2" in the Preparedness column.

IMPORTANCE		PREPAREDNESS	
VERY LOW	VERY HIGH	VERY LOW	VERY HIGH
1 -----	4	1 -----	4
	Rules of the Road		
	Target Motion Analysis		
	Navigation		
	Sonar Employment		
	Written Communications		
	Verbal Communications		
	Counseling Skills and Techniques		
	Enlisted Relations		
	FITREP Preparation		
	Developing Subordinates		
	Customs/Courtesies/Traditions		
	Professional Military Ethics		
	Security of Classified Material		
	SUBSAFE/Tagout Systems		
	Preventative Maintenance System		
	Foreign Submarine/Emerging Technologies		
	Personnel Administration		
	Financial Management		
	Military Law		
	Life as a Junior Officer		
	Decision Making Process		

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